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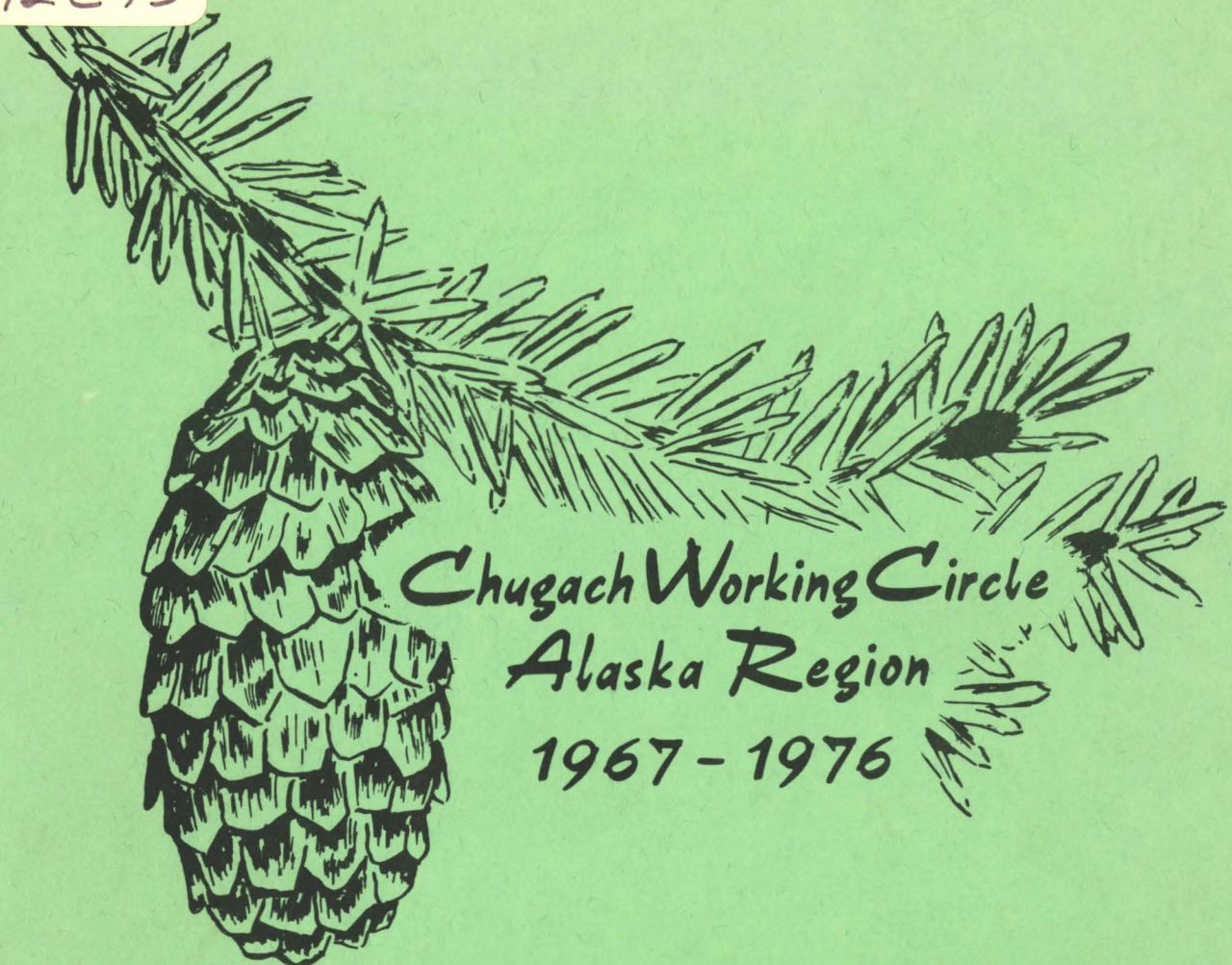

Chugach Working Circle
Alaska Region
1967 - 1976

Timber Management Plan

Plans
Timber Management
Chugach Working Circle

2410

Anchorage, Alaska

TIMBER MANAGEMENT PLAN

CHUGACH WORKING CIRCLE

CHUGACH NATIONAL FOREST
Region 10

PLAN PERIOD
FY 1967 through FY 1976

Prepared by:

W. R. Overdorff, then Forester, Chugach National Forest; John Galea, District Ranger, Kenai Ranger District; Lyle Jack, then District Ranger, Anchorage Ranger District; John Standerwick, then District Ranger, Cordova Ranger District; James E. Brewer, then Forester, Division of Timber Management, Region 10; Robert B. Mattson, Forester, Division of Timber Management, Region 10; and Carl W. Swanson, Forester, Division of Timber Management, Region 10.

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RECORD OF REVIEW AND APPROVAL
FOR
TIMBER MANAGEMENT PLAN
CHUGACH WORKING CIRCLE
CHUGACH NATIONAL FOREST
Region 10
1967

Submitted By:

S. R. Melvin Mitts — Supervisor TM Staff — 5/31/67 Date
[illegible] — District Ranger — 6/2/67 Date
Carl W. Swanson — Regional Forester TM Staff — 6/20/67 Date
Richard E. Woodbow — District Ranger — 6/6/67 Date
[illegible] — District Ranger — 6/18/67 Date

Reviewed By:

[illegible] — Chief, Division of TM — [illegible] Date
George F. Lakes — Chief, Division of Rec., L, W.L. & W.M. — 7/21/67 Date
C. J. Skrivseth — Acting Chief, Division of Eng. — 7/22/67 Date

Approved By:

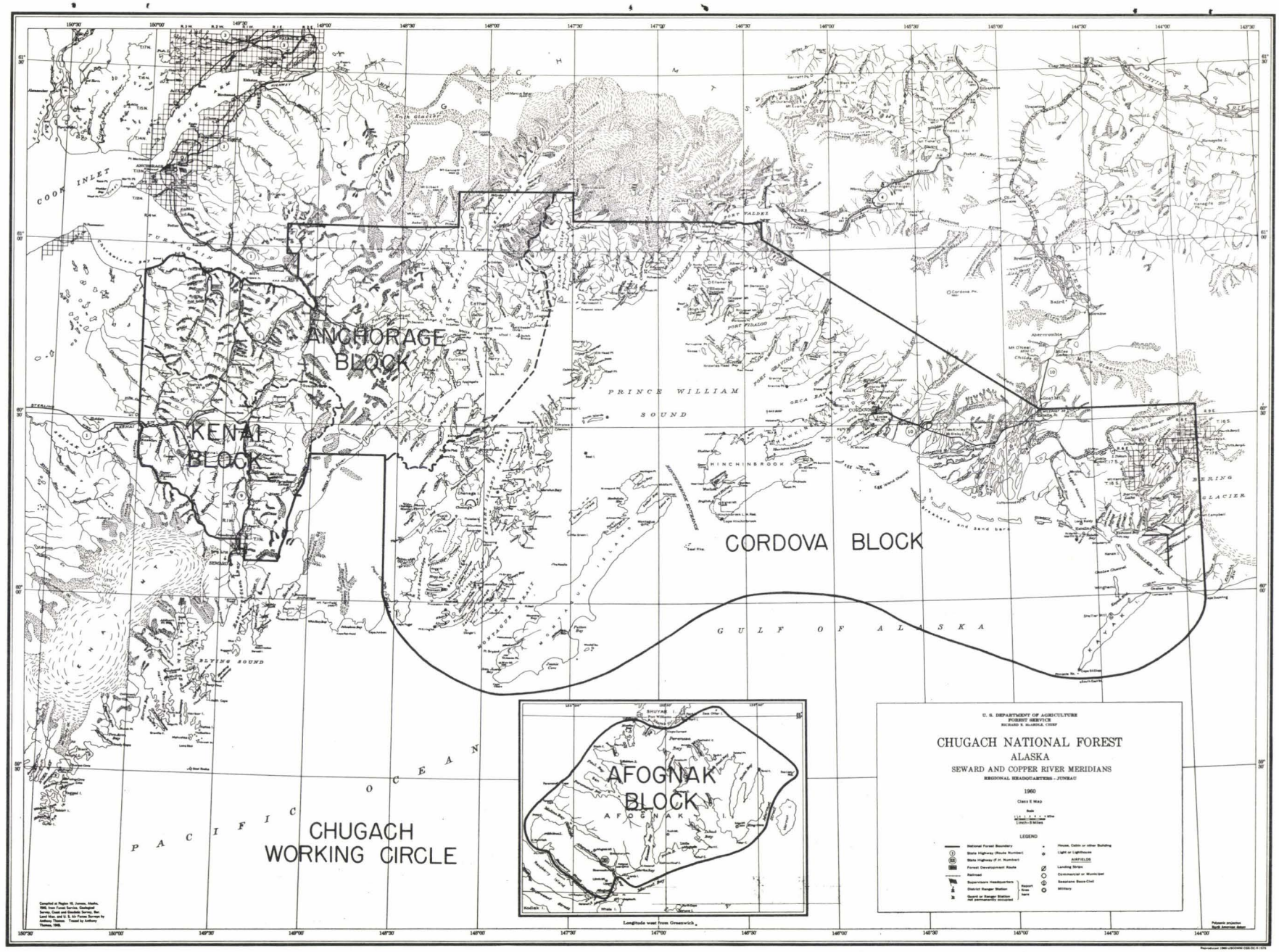
John C. Crockett — Forest Supervisor — 6/20/67 Date
W. H. Johnson — Regional Forester — 9/25/67 Date

PREFACE

This management plan was prepared in accordance with the Multiple Use Management Guide for the Alaska Region, and Ranger District Multiple Use Plans. Unless otherwise noted in the plan, all volumes are stated in terms of net volume in thousands of board feet Scribner rule, and area data in acres. Also, unless specifically stated to the contrary, all volume data in the plan are the net inventory statistics exclusive of any adjustment for differences found to occur between net inventoried volumes and scaled volumes.

Inventory information used in this plan is separately bound as "Forest Survey Report number 6, Chugach Working Circle, Forest Inventory Statistics, Chugach National Forest". Development of information found in that report is supplemented in the Appendix where referenced. Inventory statistics are effective with Fiscal Year 1967.

Typical Stand - Afognak Island


ANCHORAGE BLOCK
KENAI BLOCK
CORDOVA BLOCK
AFOGNAK BLOCK
CHUGACH WORKING CIRCLE
COOK INLET
PRINCE WILLIAM SOUND
GULF OF ALASKA
PACIFIC OCEAN
CHUGACH NATIONAL FOREST
ALASKA
SEWARD AND COPPER RIVER MERIDIANS
REGIONAL HEADQUARTERS - JUNEAU
1960
Class E Map
LEGEND
Longitude west from Greenwich

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I. SUMMARY OF PLAN

A.	National Forest Area (acres)	
	1. Total land area all classes	4,723,400
	Less area of:	
	(a) Non-forest land	3,013,800
	(b) Non-commercial forest land	961,100
	(c) Productive reserved	None
	(d) Unregulated commercial forest land	
	(1) Operable Working Group III	16,200
	(2) National Forest currently inoperable area	423,200
	2. Regulated National Forest operable commercial forest land. (Within Working Groups I and II)	309,100
B.	Inventoried Net Volumes National Forest Commercial Forest Land MBF Scribner	
	1. Total volume commercial forest land MBF	14,299,400
	Less volume of:	
	(a) Productive reserved	None
	(b) Operable Working Group III (Unregulated)	374,800
	(c) National Forest currently inoperable area	6,362,400
	2. Regulated National Forest operable inventoried volume. (Within Working Groups I and II)	7,562,200

C. Allowable Cut - Computed annual cut based on operable regulated commercial forest land area and volume (MBF)

Inventory Net	Utilized Scaled Volume
90,000	67,500

D. Sustained Yield Capacity - Computed annual productive capacity of desired forest, based on regulated and currently inoperable commercial forest land area and volume (MBF)

Inventory Net	Utilized Scaled Volume
167,500	125,600

E. Revision of Plan

The Five-Year Action Plan will be revised annually by each District Ranger. The entire management plan will be reviewed and revised at ten-year intervals. This plan will be revised for the second plan period to be effective July 1, 1977. Complete or partial interim revisions of the plan will be made for such reasons as catastrophic losses or major changes in working circle or administrative boundaries. Decisions to make interim revision of the plan and the extent of the revision will be made by the Regional Forester.

F. Budget and Control

The Forest Supervisor will allocate portions of the allowable cut to the Ranger Districts by means of the Five-Year Cutting Budget (FSM 2417.3). Control records will be maintained in accordance with current Regional instructions (FSM 2419).

Undercuts experienced in a fiscal year of any 5-year budget period beginning July 1, 1967 may be made up during following fiscal years of the same 5-year budget period provided that not more than one and one-half years approved allowable cut is made in any one fiscal year. Cumulative undercuts of one 5-year budget period may be cut in the next 5-year budget period provided that not more than one year's approved allowable cut may be carried forward from one 5-year budget period to the next. Cumulative undercuts carried forward to the next budget period will normally be spread over the 5 fiscal years of the budget period in approximately equal amounts. No undercut balances will be carried forward upon revision of the plan.

Overcuts in any one fiscal year may exceed the approved annual allowable cut by not more than 25 percent provided that the total allowable cut for any 5-year budget period beginning July 1, 1967 is not exceeded by more than 5 percent. Cumulative overcuts of one 5-year budget period will be carried forward as a reduction of authorized cut for the next 5-year budget period. Normally, the total overcut volume reduction carried forward will be distributed equally over the 5 fiscal years of the next 5-year budget period.

The Regional Forester may authorize exceptions to the above limitations when necessary to permit prompt salvage of catastrophic losses or when a national emergency exists.

Notwithstanding the exceptions permitted above, every effort will be made to budget cuts that will avoid large fluctuations in production. The objective of management is to provide an even flow of timber products. Unjustified undercuts or overcuts, though balanced off to meet authorized deviations, will not accomplish this objective.

Budget plans require the approval of the Regional Forester.

Budgeted and cut volumes are scaled volumes. The cut record contained in the control records for this plan period then must be adjusted to obtain true inventory depletions so that this inventory may be used for future calculations of allowable cut. Unless further studies indicate any change in the relationship of scaled volume to inventory volume, 1,318 board feet of inventory is depleted for each 1,000 board feet cut. Each 1,000 board feet of inventory volume may be expected to yield 758 board feet of scaled utilized volume. (FSM 2491.12)

ALLOWABLE CUT STATEMENT

Cutting method	Intermediate (FSM 2471.4)	Salvage	Regeneration (FSM 2471.2)				Total
			Group, patch, strip, stand	Shelterwood or seed tree		Selection	
				Preparatory or Seed	Removal		
Regulated volume:							
Sawtimber(MMBF) 1/			67.5				67.5
Other (M cds.)							
Estimated cut area (acres)			2,990				2,990
Unregulated additional cut objective(M cds.)	xxx	xxx	xxx	xxx	xxx	xxx	170

1/ Utilized scaled Scribner net.

II. INTRODUCTION TO TIMBER MANAGEMENT ACTIVITIES ON WORKING CIRCLE

A. Summary of Results Under Previous Management

Previous efforts to develop timber management plans for the Chugach National Forest have been oriented toward management of the resource within the bounds of the Kenai and Cordova Working Circles. Control records through F.Y. 1967 reflect this division. Plans for the two were not satisfactorily completed, and until now, management has been carried on within the scope of Regional policies having application to the Forest.

Demands of the timber industry on the working circle have been sporadic. Construction of the Alaska Railroad began in 1903. From then until 1946 when the railroad began using treated ties exclusively, untreated ties were an important product from the Kenai Peninsula. Numerous areas along the railroad tracks and in the northeastern section of Prince William Sound were cut over for construction and maintenance of the Alaska Railroad. In the Cordova area, material for ties and bridge timbers was cut to build the Copper River and Northwestern Railroad.

Piling was one of the chief products in Prince William Sound until 1959. At that time, fish traps were outlawed when Alaska acquired the right to manage its own fisheries under Statehood. Cannery construction has come to a standstill and the demand for piling has tapered off sharply.

In past years mining was also a major industry in Prince William Sound. Much of the shoring for copper and gold mines was cut from the Forest. Since World War II, the mining industry has declined to a position of minor importance and consequently the demand for mining timbers is almost nonexistent.

Sawtimber production has been relatively low. In the past, mills sprang up in nearly every small community. Some of the more readily available timber was harvested and the mills were eventually abandoned. Production in those that have survived is limited to timbers and boards suited to local construction.

During World War II, the U.S. Army had a sizeable lumbering operation on Afognak Island. A sawmill was installed on the east shore of Danger Bay. About 440 acres were cut in the vicinity of Danger Bay and Afognak Bay to provide lumber for military installations on Kodiak and the Aleutian Islands. A short time after the war ended, the project was abandoned.

The development of a market along the railbelt extending from Seward to "Interior" Alaska has increased demand to some extent and resulted in construction of sawmills at Whittier and Seward during the last

fifteen years. In 1960, Koppers Company established a treating plant in Whittier which revived the demand for hemlock tie material from Prince William Sound. Operating difficulties associated with the fire which destroyed the Columbia Lumber Company sawmill at Whittier (which had supplied steam for the treating plant) and failure to obtain the contract for supply of ties to the Alaska Railroad led to closure of the plant in 1963.

The Good Friday earthquake in 1964 created a temporary demand for untreated pilings and large dimension timbers for repairs to bridges and docks. This was short-lived and demand for these specialty products is back to normal. As a matter of interest, the tsunami which occurred as a result of the earthquake destroyed facilities at five sawmills which processed logs from the working circle. These plants had a combined annual log capacity of approximately 12 million board feet.

The average annual cut for the years 1955 - 1965 has been 5.3 million board feet, but has varied considerably depending on the prevailing market. Seventy-six percent of the cut in these years was taken from Prince William Sound, since a relatively higher quality timber is found in that area, and existing sawmills attempt to secure a major portion of their log supply from it.

In 1964, a dry kiln was added to the Kenai Lumber Company's plant facilities at Seward. This was the first and only mill on the working circle to finish lumber to such a degree. In August 1966, this mill suffered severe fire damage which rendered it inoperable. At present, timber from the Chugach Working Circle is processed by seven sawmills. The mills have a combined annual capacity of about 4.8 million board feet. Most are not operating at capacity.

The first comprehensive inventory of the Chugach National Forest timber resources has been completed by the Region and the Northern Forest Experiment Station and is the source of area and volume data cited in this plan, (See Forest Survey Report No. 6, Chugach Working Circle Forest Inventory Statistics). In July 1964, the Forest was reorganized into three Ranger Districts to provide more effective management. In addition, the decision to consolidate the entire Forest into one working circle was recently made. This will improve the accuracy of Forest inventory statistics,coordinate administrative and management boundaries, and provide the flexibility of management needed when markets improve and log requirements approach the allowable cut.

Progress toward establishing a stabilized harvest close to the allowable cut will depend on an increased volume of business by the existing wood processing plants and the introduction of new plant capacity to the area.

Low demand for lumber from existing plants is related to its generally poor quality. This in turn is related to a dearth of modern equipment and the generally poor form and limbiness of the timber.

A large proportion of the timber is more suitable for fiber and particle products than for products requiring higher quality logs. Therefore attainment of full allowable cut will depend upon stimulation of a new market for fiber quality logs and refinement and expansion of manufacture for local use.

B. Description of the Working Circle

The Chugach Working Circle includes the entire area of the Chugach National Forest. It is located in the south central region bordering the Gulf of Alaska. Included also is Afognak Island, an isolated unit which lies 220 nautical miles southwest of Cordova. The Chugach is both the most northerly and most westerly forest in the National Forest system. The net area is 4,723,416 acres.1/ Land adjacent to the working circle is nearly all in Federal ownership. It is bounded on the west by the Kenai National Moose Range, on the north and east by public domain, and on the south by the Gulf of Alaska and Prince William Sound.

The working circle is divided into four management blocks - Anchorage, Kenai, Cordova and Afognak. (See map). Block boundaries coincide with Ranger District boundaries except for the Afognak Block which is part of the Anchorage Ranger District.

The granting of Statehood to Alaska carried provision for the State to select up to 400,000 acres of National Forest land for community expansion and recreation purposes. Foreseeable State land selections over a twenty year period include areas at Cooper Landing, 3,000 acres; Hope, 1300 acres; Moose Pass 900 acres; and Cordova, 6000 acres. Elimination of these areas from the working circle will have little effect on the volume of timber removed from management. The proposed Cooper Landing and Moose Pass selections are located within existing travel influence zones designated in Multiple Use Plans. Volumes on such areas are regulated. Elimination of National Forest lands adjacent to Cordova and Hope may reduce the annual allowable cut by about half a million board feet.

C. Administration of the Working Circle

Each District Ranger is responsible for the multiple use administration of the blocks of the working circle comprising his District. The Forest Supervisor should generally distribute the working circle's

1/ Official acreage as of July 18, 1966.

budgeted annual cut to each Ranger District on the basis of the indicated allowable cut for each block. The Ranger will plan sales to meet his allocated cut on the District Five-Year Action Plan.

The Kenai Peninsula possesses a primary highway system and arterial railroad, but few development roads. Travel and transportation to Prince William Sound and Afognak Island are wholly by air or water.

Travel is the major administrative problem in this part of the working circle because of the great distances and prevailing adverse weather conditions. Extended periods of turbulent winds, driving rain, poor visibility, and dangerous surf conditions make boat and air travel equally difficult. Use of helicopters for travel to locations where landing by boat or conventional aircraft is uncertain may partially solve many of the problems encountered. Resident management by District personnel during the logging season may also prove feasible in the isolated Patton Bay - Beach River area on Montague Island, and on Afognak Island. Both areas support a large volume of accessible commercial timber and a substantial operation in either area will require the full attention of a Forester or forestry technician.

D. Forest Description

Kenai and Anchorage Blocks

Forests of the Kenai and Anchorage Blocks include Sitka spruce (Picea sitchensis), white spruce (Picea glauca), western hemlock (Tsuga heterophylla), black spruce (Picea mariana), mountain hemlock (Tsuga mertensiana), paper birch (Betula papyrifera), quaking aspen (Populus tremuloides), and black cottonwood (Populus trichocarpa). Over most of this area, white spruce and cottonwood dominate the valley bottoms, with mountain hemlock mixing with spruce on the lower mountain slopes. Mixed stands of Sitka spruce and mountain hemlock are predominant in areas close to salt water. Little commercial timber is found above 1,000 feet. Steeper slopes are generally covered with thick stands of alder and scattered patches of scrub hemlock in the 1,000 to 2,500 foot elevation range. Above 2,500 feet, alpine meadows predominate. Approximately two-thirds of the commercial forest land in this portion of the working circle support overmature, decadent, uneven-aged climax forest stands. The remainder of the commercial forest land supports young even-aged stands which have followed fires of the past fifty years.

Tree size, quality and volume per acre are low compared to other timber-producing areas in southeastern Alaska or Prince William Sound. Some of the better white spruce stands average 10 MBF per acre while limited Sitka spruce stands run as high as 20 MBF per acre.

Cordova Block

Most of the commercial forest land of the Prince William Sound area supports overmature, decadent, climax forest stands of an uneven aged western hemlock-Sitka spruce type. The principal species of this type are western hemlock (Tsuga heterophylla), and Sitka spruce (Picea sitchensis). Minor commercial species include Alaska cedar (Chamaecyparis nootkatensis) and mountain hemlock (Tsuga mertensiana). Hemlock is the predominant species. It occurs in mixture with spruce and cedar, and to a lesser extent in pure stands. Spruce is found in nearly pure stands in the Patton Bay - Beach River area on Montague Island, and in the Martin River - Kushtaka Lake region. Small and scattered spruce stands are located on creek and river deltas throughout the Sound. In mixed stands, spruce is found with hemlock in nearly every part of the Sound except the area from Sheep Point to the head of Orca Inlet. The cedar type is found in the area between Port Wells and Long Bay on the north side of the Sound, on Glacier Island, and to some extent on Hawkins Island. These cedar stands are either pure or mixed with western and mountain hemlock.

Afognak Block

Afognak Island differs from other coastal forest areas in Alaska in several interesting respects. The most notable of these differences is the extensive development of grassland and brush area. Approximately half of the island is occupied by these vegetative types. Muskegs, which are so common elsewhere in the Region, are almost lacking. Only one coniferous tree species, Sitka spruce, is found on the island. These primary stands represent many age classes. The extreme western natural extension of the Sitka spruce type is found on the norther shore of adjacent Kodiak Island.

The greatest deficiency in the Afognak timber appears to be the limbiness. This limbiness coupled with poor natural pruning consequently produces a high percentage of lumber in the common grades. The timber is generally short with abrupt taper in the upper part of the bole. Rot is not as prevalent as it is in the timber of the Prince William Sound area.

Timber surrounding lakes, swamps, and grassland openings is generally of poor form and too knotty for commercial use. Many trees and some of the stands are overmature. However, some of the better timber stands will produce upwards of 35 MBF per acre.

E. Physiography

Most of the working circle is characterized by rugged mountainous terrain. Elevations range from sea level to 6,500 feet on the Kenai Peninsula and to 10,000 feet on the mainland, adjacent to Prince William Sound. Afognak Island is lower, with elevations to 2,600 feet, less rugged, and much of the area is below timberline. The entire island is covered with a layer of volcanic ash from six to

eight inches deep, with a thin surface layer of organic matter. The layer of ash results in good drainage.

The eastern part of the working circle is heavily glaciated. Valley bottoms in general are long and narrow. Soils vary from fine textured sediments on delta areas to thin rocky soils on the higher mountain slopes. Muskegs are scattered throughout the area. Extensive areas of moderately level ground are less common in Prince William Sound.

Many streams in the Sound are important producers of pink, red and chum salmon. Salmon streams are also found on the larger islands such as Montague and Afognak, in addition to many on the Kenai Peninsula.

Commercial forest land on the Kenai and Anchorage Blocks is generally limited to the valley bottoms adjacent to the Seward-Anchorage and Sterling highways. The majority of commercial timber is located within one-half mile of salt water and below 1,000 feet in elevation in Prince William Sound, and within two miles of salt water on Afogank Island.

The western portion of the working circle does not experience the maritime climate found in Prince William Sound and on Afognak Island. Annual precipitation at Seward is 65 inches while at Kenai Lake it is less than 25 inches. Comparatively, Cordova has an annual precipitation of 98 inches, while 140 inches is not uncommon out on the Sound. Afognak Island has a mild maritime climate but with lighter rainfall than Prince William Sound. The snow-free period extends from May through October. Favorable weather on either end can extend the logging season to eight or nine months, however, mid-winter conditions are severe and generally preclude profitable logging operations.

Within a period of minutes on March 27, 1964, an earthquake, believed to be the strongest on record, greatly reshaped shorelines of the working circle. In some areas affected by the earthquake, the land level lowered, causing some uplands to become submerged; in other areas the reverse occurred and intertidal zones were uplifted. The volume of merchantable timber lost as a result is estimated to be negligible. One adverse effect, however, occured with the uplift of former tidelands in Patton Bay on Montague Island. Logging chances were considered marginal in this area prior to the earthquake because of the exposed beach and surf conditions. Normal log rafting operations are now considered uneconomical.

F. Transportation

The Kenai and Anchorage Blocks are accessible by both highway and railroad. The Seward-Anchorage Highway and the Sterling and Hope

Highways lie adjacent to much of the timber-producing area in this portion of the working circle. There are a few secondary roads but most commercial timber areas will require new access roads. The highway system links the main lumber-producing part of the Kenai Peninsula at Seward to the principal market at Anchorage. The Alaska Railroad transports some lumber to points along the railbelt and has been used to haul logs from the Moose Pass-Seward area to Anchorage and Palmer.

Some logging near Kenai and Trail Lakes is planned. Construction of roads may not be practical for all sales in these two areas. It may be more practical to yard logs directly to the lakeshore and transport them in small rafts to loading areas at Cooper Landing, and to the railroad siding at Moose Pass.

Kenai Lumber Company received the majority of its logs from Prince William Sound. With improved docking facilities at Seward, lumber exports may materialize via the State Marine Highway System or oceangoing vessels. Because of available water, rail and highway transportation, an adequate labor supply, and favorable community facilities, Seward is expected to maintain an active position in the forest products industry on the working circle.

The largest obstacle to a timber sales program on the Kenai and Anchorage Blocks is the high cost of road construction in an area having low volumes of timber. Most readily accessible areas have been logged. Most of Prince William Sound is accessible only by air or water transportation. Plans for extension of the Copper River Highway to Chitina over the old Copper River and Northwestern Railroad route were disrupted as a result of earthquake damage along the route. This highway would link Cordova with the Interior Alaska highway system at Chitina, and could have an important effect on the development of the working circle. The Richardson Highway links Valdez with the Alaska highway system. Although Valdez is not within the National Forest boundaries, the highway could provide access to markets in the interior.

Although stump-to-tidewater logging prevails over much of the working circle, some stands will require the development of roads, usually up to five miles long, to accomplish their harvest. Prominent among these are the extensive stands of spruce in the vicinity of Martin River and Kushtaka Lake and on Afognak Island.

A proposed Bering River Highway has been located from Mile 39 on the Copper River Highway to Stillwater Creek, near the eastern boundary of the Chugach National Forest - a distance of thirty-eight miles. Construction of the highway in the future depends on reconstruction of the Copper River Highway and possible development of oil fields in the vicinity of Katalla, or development of the coal fields located in the areas.

A large portion of the timber in Prince William Sound and on Afognak Island is directly accessible to water by tractor or cable yarding.

The towing of log rafts over long distances of exposed waters is a common problem encountered in Prince William Sound. The waters of the Sound are often quite perilous and subject to sudden squalls and gales. Often rafts are broken up in transit or storage. In most cases the transporting of logs overland is impossible due to the isolated locations of the logging shows and the barriers of rugged terrain and extensive stretches of muskeg.

Another problem encountered in rafting operations is bundling difficulties. A number of the logging chances have bundling sites with gently sloping beaches and large areas of shallow water. This condition requires unusually high tides to float the bundles so they can be towed or pushed into deeper water. Large swells build over the shallow stretches of water and often break up the bundles before they can be towed to protected water for rafting. One solution appears to be the use of barges for water transport of logs. In general, rafting conditions in the Afognak vicinity are better than those found in the Prince William Sound area due to the superior dump sites, and numerous protected bays, however raft towing from here to mainland areas is considered impractical.

G. Regeneration and Sale Area Betterment

Surveys have shown that previously logged areas except those on Afognak Island are regenerating satisfactorily by natural means. No major problems are evident. An administrative study conducted on the 1959 Kenai Lake burn to determine the best method of reforestation shows that artificial regeneration is effective but costly. Observation of other burn areas indicate that white spruce stands regenerate naturally following fires. A significant difference, however, between artifically and naturally regenerated areas is a time lag of five to 15 years for natural regeneration. Due to a relatively slow growth rate, artificial regeneration will probably not be economical for many years.

There are, however, other considerations in reaching conclusions regarding artificial regeneration. In most cases within the white spruce type, timber harvesting is beneficial to the production of moose browse for a period of ten to fifteen years. The same is true of hemlock-spruce stands in Prince William Sound and spruce stands on Afognak Island where post-logging conditions are favorable for deer and elk browse respectively. Where browse production is a key consideration there are positive management values to be gained from acceptance of an extended regeneration establishment period.

In recreation areas where prompt regeneration is desired to protect esthetic values, artificial regeneration should be considered even though natural regeneration is expected to occur within an economically acceptable period.

Artificial regeneration may also be desirable within the general forest zone if natural regeneration periods are expected to be long, the site is good and browse production is of marginal utility. On the poorer sites artificial regeneration will probably be practical only when the natural regeneration process is expected to be extremely slow.

In some timber stands in Prince William Sound, areas supporting heavy concentrations of undergrowth were poorly stocked, and produced seedlings that were below par in vigor. To investigate further the possibilities for artificial treatment, 114 acres of cutover land on Montague Island were scarified in an administrative study between 1960 and 1963. Nearly all areas scarified were seeded. Scarification consisted of two broad types, complete and partial. Conclusions reached from subsequent examinations were that regardless of the degree of ground preparation, satisfactory restocking occurred. Where brush was present it appeared to retard growth to some extent. This may, however, eventually prove to be an asset in naturally producing a desirable number of stems per acre.

As a result of these and other studies conducted on the Tongass Forest, and past reproduction surveys, it is concluded that scarification and artificial seeding will be necessary only in a few problem areas.

A regeneration problem on old cuttings on Afognak Island, long thought to be animal damage, has been diagnosed as a primarily fertility problem. A study to evaluate fertilization in this area should be made in the near future.

H. Timber Stand Improvement

Fourteen percent of the commercial forest land area within Working Groups I and II is in stands of young growth sawtimber, poles, and seedlings and saplings. Age classes of the timber in some stands are enough lower than the selected rotation age that stand improvement measures might be considered to upgrade the composition, growth and quality if a market for resulting products existed.

Results of timber stand improvement are not expected to be favorably commensurate with costs for some time. Treatment of selected stands to improve growth and quality will increase in importance as the acreage of second growth stands increase and economic conditions become more favorable. Early consideration should be given to T.S.I. measures designed to supply local construction needs from the best young growth on high quality sites. Re-establishment of a wood preservative treatment plant on the working circle could provide products such as poles, piling, guardrail posts and railroad ties to satisfy local demand.

Opportunities for commercial sales products in the form of ties, poles, house logs and firewood to permit needed stand treatment may be more prevalent on the Kenai Peninsula. Improved markets will eventually make such intensive management practices economically feasible.

I. Protection

1. Fire. Fire conditions on the Kenai Peninsula are more severe than on any other area in the Region. The climate is characterized by low rainfall, particularly during the period of maximum daily sunlight and prior to "greening up" of flash fuels. This combination of conditions has resulted in numerous fires since the early 1900's. Many of these occurred along the Alaska Railroad right-of-way in days prior to use of diesel engines. Many also occurred near formerly active mining camps. The largest fire in recent times was the Kenai Burn in 1959 which destroyed more than 3,000 acres of timber on the shore of Kenai Lake.

Because of weather conditions, fire damage within the Cordova Block has been nil. The fire problem on Afognak Island is more acute than on areas within Prince William Sound. Afognak receives less rainfall, has a heavy grass fuel type, and is isolated from the Ranger District headquarters. Increased prevention efforts throughout the Chugach Forest have lessened the area burned annually to near zero in the last few years.

2. Insects. Forest insect activity within the Kenai and Anchorage Blocks has generally remained at a low level. Principal insect enemies are the spruce bark beetle (Dendroctonus obesus), hemlock sawfly (Neodiprion tsugae), and the black-headed budworm (Acleris variana).

The largest outbreak of the spruce bark beetle in recent years was the 3,000-acre infestation in the Blackstone Bay area near Whittier. After several years of heavy loss, the infestation appears to have subsided. Another heavy infestation of spruce bark beetle occurred on Afognak Island in the early 1930's in the vicinity of Big Kitoi Lake. Populations of the spruce bark beetle increased several fold in 1962 and caused moderate damage to spruce stands on the Kenai Peninsula. The rate of tree mortality was below outbreak proportions, but the upward trend of populations caused some concern at the time. The 1963 survey showed that the expected increases in populations failed to materialize and the tree mortality was below that of 1962. Subsequent forest insect surveys through 1966 have shown beetle populations to continue at endemic levels with relatively small acreages of killed timber resulting.

Recently a black-headed budworm infestation occurred in the Cordova area. However, very little damage resulted because the outbreak did not reach epidemic proportions and the damage was generally concentrated in the current year's growth. The population continued at a very low level through 1966.

3. Disease. At present, no diseases are known to exist on the working circle in other than endemic stages. No epidemic conditions have occurred, but some diseases are quite widespread.

Fomes pinicola, Polyporus sulphureus, Polyporus schweinitzii, Fomes annosus, and Fomes igniarious are the principal diseases found. The primary means of entrance for these fungi appears to be through frost cracks.

A recent survey revealed an unexplained discoloring and loss of needles in some 200 acres of mountain hemlock south of Portage on the Seward-Anchorage Highway. There were several instances where all vegetation beneath the affected trees died. It is suspected the malady is a disease and further investigation is being undertaken.

A significant browning of white spruce caused by needle rust occurred in the area between Moose Pass and Quartz Creek during the last few years. Local residents recall an occurrance of what is believed to have been the same needle rust approximately ten years ago.

Because the Forest is predominately in overmature, climax stands, volume loss by decay is considerable and widespread throughout the working circle. It is not known to what extent residual trees injured in logging contribute to the spread of disease.

4. Erosion. Forested soils on the Kenai Peninsula are mostly podzols and alluvial soils. Clay contents are relatively low except in lake deposits such as the unstable clay soils found near Kenai Lake. Most soils have good erosion resistance while the duff is intact, but are readily eroded when it is removed.

Soils of the Cordova Block are similar to those of southeastern Alaska, except for the prevalence of glacial outwash soils on the mainland.

Most of the good spruce stands in Prince William Sound are located on the flood plains of glacial streams. These streams are swift, sometimes carry large volumes of water and often shift channels widely over their flood plains. This condition is common on the Patton Bay-Beach River, Port Chalmers, and Sheridan Glacier Flats areas and presents a serious problem in timber sale administration.

5. Rodents. Rodent damage is not serious over most of the working circle. One item worthy of mention is damage to paper birch by red squirrels. A large number of trees in the young stands in the vicinities of Quartz Creek and Hope exhibit horizontal girdles that have been attributed to red squirrels. Even if death does not result, and it commonly does, the girdles provide infection entrances for fungi in a species that is particularly susceptible to decay.

A full evaluation of rabbit, beaver, and porcupine damage in timber stands has not been made, nor does it now appear sufficiently serious to warrant further study.

III. PRESCRIPTION

A. Management Objectives

Management of the timber resource on the working circle will be directed to making available, on a sustained-yield basis, a maximum amount of timber of a size and quality as required by south-central Alaskan wood industries to the extent of the full allowable cut. To accomplish this objective and assure increasing yield and usefulness of the timber resource, emphasis will be placed on the following goals during this plan period:

1. Analyze end product potential of the timber resource. Based on this analysis, design a sales program to attract such industry as can best recover the intrinsic value from the stands. An important aspect of this analysis will be concerned with the working circle's ability to supply timber for potential local end product consumption.

2. Maintain an orderly sales program which will stabilize existing wood products industries in communities on or near the working circle.

3. Cooperate with Regional Staff in developing information relating to marketing problems and industry expansion leading to the development of manufacturing facilities which can fully utilize the allowable cut.

4. Activate Forest program of aerial photo area reconnaissance and layout of suitable chances, utilizing soil survey data as developed and Forest Engineering help, to provide an increasing backlog of suitable sales or operating units which will enable the Forest to move rapidly toward attracting significant new industry.

5. Examine areas covered with multiple use zoning that prohibits normal clear-cut timber harvest and determine if there are areas within the zone where cutting under special prescriptions is feasible and desirable.

6. Leave cutover areas in the best possible condition for prompt establishment of a satisfactorily stocked stand of reproduction following cutting; secure prompt regeneration of desired species composition on harvested areas by natural regeneration or by artificial methods where necessary, except where delayed regeneration is desired in key wildlife areas.

7. Prepare for future planning, a list of areas where timber stand improvement work may be economically feasible to accomplish an increase in quality logs for the future. Toward this end, soil-site index maps should be made for selected areas.

8. Investigate and develop information relating to operability criteria.

9. Initiate and pursue a regeneration study on Afognak Island and provide information leading to successful establishment of satisfactory new stands following logging.

10. Develop and maintain improved protection of timber stands and cutover areas from fire, insects, disease, erosion and windthrow; promptly salvage losses sustained where operability, market and economic factors permit.

11. Emphasize multipe use concept of management in harvesting timber on all areas, with special emphasis on areas where key values and primary use is other than timber production.

(a) Plan harvest cuts where possible to benefit recreation and wildlife goals.

(b) Evaluate road needs and develop and maintain a correlated long range multi-purpose road program to provide access for timber harvest and recreation use.

(c) Design some sales as roadside demonstration areas to inform the public of timber management practices emphasizing silvicultural and economic desirability of clearcutting.

(d) Maintain a balance of cut by Block, from Working Groups I and II areas which is proportional to the respective group's contribution to the Allowable Annual Cut (i.e. about 3 percent of the cut should be from Working Group II).

B. Coordination With Other Uses

Commercial Forest Land. The Multiple Use Management Guide for the Alaska Region and the District Multiple Use Management plans document coordination measures between timber management activities and other resource uses. Some timber stands, especially on the Kenai Peninsula, are particularly suited to uses other than timber production. Public use on the working circle is heaviest in National Forest areas adjacent to the communities of Seward, Cooper Landing, Moose Pass, Hope, Portage, and Girdwood, and adjacent to the Seward-Anchorage and Sterling Highways. The majority of commercial forest land on the Kenai Peninsula is located adjacent to these routes. Multiple use zones have been established to protect recreation and wildlife resources, recognizing that much of this area is favored for its recreation qualities and opportunities. Timber management activities which will adequately maintain the qualities for which zones were established can be effectively accomplished through designation as working groups those areas having the same general management prescriptions. Cutting practices on areas within these groups will be consistent with the maintenance of stands of timber satisfactory for the use for which each individual area is classified.

Working Groups. The working groups established will assist timber managers to coordinate their activities with multiple use objectives and provide a basis for regulation of cut. It is expected that these initial working groups will be modified and expanded as management intensifies.

Most of the timber stands on the Working Circle are of an old growth climax type, with growth increment assumed to be balanced by decay and mortality. The harvesting method which will most effectively convert these stands to fast growing, vigorous, young forest is block clearcutting. Clearcutting results in scarification of the humus layers and in higher soil temperatures which are beneficial to germination and growth of seedlings, as well as humus decomposition. Clearcutting will also result in the desirable even-aged stands of near-equal volumes of spruce and (except on the Afognak Block) hemlock. Even-aged silvicultural practices will be applied, except on special working groups where mixed-age stands are necessary to meet multiple use management objectives. Summaries and descriptions of areas within each working group are found in Appendix, pages pages CA-7 to CA-11.

GROUP I. This group includes the general forest and prime habitat zones illustrated in District Multiple Use Atlases; municipal supply and other high value watersheds; and those areas where occupancy privileges have been extended which do not preclude commercial timber sales. Modification of normal regeneration cutting practices may be required in prime habitat zones and watersheds, the required modifications will not significantly affect cut regulation.

Prescribed silvicultural treatment of timber stands in municipal supply and other high value watersheds will be based on water needs specified in individual watershed management plans. To date, working circle watersheds have been identified but inventories of water requirements and uses will not be complete until 1967 or later. There are presently no watershed management plans or watershed cooperative management agreements in effect on the working circle. Areas where recognition of watershed values is required as a prerequisite to logging are listed on Appendix, page CA-7.

Management plans for special game management units are prepared where needed to supplement District Wildlife Management Plans. Objectives of management in these areas may vary, but relate to preservation or improvement of habitat quality or condition. Prescription of cutting practices is a function of the unit plan. The Copper Delta Game Management area is the only unit on the working circle to date. Since there is little commercial timber on the area, cutting will have no adverse effect on the wildlife habitat. Timber sale plans are subject to review by all agencies signatory to the Management Plan.

Timber sales on lands under special use permit to other government agencies are subject to the approval of the resident agency.

Group I area and volume is fully regulated.

GROUP II. This group includes the travel influence and water influence zones; the recreation occupancy zones programmed for development beyond 1976 (recreation program period four); and development-type recreation areas listed in the Districts' Multiple Use Atlases and Forest Recreation Management Plans. Cutting practices in this group are generally limited to those compatible with aesthetic values. Where established recreation is of overriding importance, timber may be harvested by special cutting or salvage cutting. Emphasis will be to cut the large, overmature or high risk trees in such a way that aesthetic values will not be impaired. The remaining portion of the area will be harvested in small, well screened clearcuts or by special prescription. Potential recreation sites may be harvested by normal regeneration cutting when it is expected that there will be a satisfactory second growth stand on the site by the time it is needed for recreation.

The cut in this group is regulated through a modified rotation.

GROUP III. This group includes timber stands principally on areas where management in near-natural condition is a major objective. Included are dispersed-type recreation areas including proposed scenic and other areas proposed for classification under Regulation U-3. It also includes recreation and non-recreation occupancy zones established to satisfy the present need for land for recreation and for the construction and use of man-made facilities.

The cut in this group will be substantially confined to salvage and sanitation cutting and is unregulated.

Productive Reserved area is commercial forest land withdrawn from timber utilization by statute or administrative regulation. Permanent research plots designated by the Northern Forest Experiment Station, and devoted to uses connected with the long-term study of forest management are the only areas presently "reserved". Plots are marked on the ground by metal tags attached to all trees within the plot boundaries. Plot acreages and volumes are negligible. At the end of each plan period, the Northern Experiment Station should be asked to review their needs and present a revised description of areas to be "reserved" for research purposes. Buffer strips adequate to protect them against harvesting and windthrow will be maintained. Area and volume for reserved areas subsequently withdrawn will be listed in the Timber Management Historical Atlas as they are established.

IV. REGULATION

Regulation of cut is by volume with an estimate of area to be treated. Volume cut during this plan period will be considered to be from area classified in the Forest Inventory as currently operable commercial forest land (C.F.L.). Unregulated cuts are also calculated for currently inoperable commercial forest land. The unregulated cut for currently inoperable C.F.L. is primarily useful as a tool for further long range planning. Separate indicated cuts are calculated for each of Working Groups I and II, and for the four blocks. These indicated cuts should be used for cutting budget distribution to Ranger Districts.

A. Volume Included. Since currently operable areas are not mapped, all National Forest commercial forest land area and live volume is considered regulated except Working Group III areas. No significant market now exists for the timber from this working circle. However, experience on the Tongass Forest indicates that cottonwood is a marketable pulp species. A definite market potential for birch veneer, quality lumber and pulp exists. There is no reason to expect that, when a market is developed for timber from this area, any inventoried species will fail to find acceptance by that market. Unregulated volumes cut, which are not charged to the allowable cut, will be restricted to:

(1) Logging waste disposed as such from areas where a regeneration cut has already been made.
(2) Dead or dying trees disposed as salvage.
(3) Volume cut from commercial forest land area which is cleared for permanent removal from timber production.
(4) Any volume cut from Working Group III areas.
(5) Volume realized from thinning.

Regulated volume includes all currently operable volume of all species within Working Groups I and II. Currently operable stands are those expected to yield a conversion return (selling price less all costs) equal to normal profit plus minimum stumpage under the market and development conditions expected during the next 20 years.

In addition to the currently operable volume described above, the A.A.C. for the rotation includes an estimated yield from presently immature stands (pole timber, seedlings and sapling) which are expected to mature and become operable prior to liquidation of currently operable timber.

B. Determination of Cut

Basically, the Hanzlik formula was used to determine an indicated cut which was refined through tabular analysis. In this formula:

$$Ac = \frac{Vm}{R} + I$$

where; Vm = Volume of mature timber
R = Rotation
I = M.A.I. of immature stands

we have let;

Vm = currently operable volume within Working Groups I and II
I = M.A.I. of immature stands within Working Groups I and II which would be currently operable except for present low volumes.

C. Determination of Site Index

Site indexes for the Afognak and Cordova Blocks and portions of the Anchorage Block adjacent to Prince William Sound are described in the 1960 Administrative Study, Estimating Yields of the Timber Stands on the Cordova Working Circle, Region 10, by Gregory and Laurent.

Calculated average site indexes for stands 80 to 130 years old are:

Afognak-67
Prince William Sound-62

Site indexes for the Kenai Block and inland portions of the Anchorage Block have not been measured. Due to the relatively small volume of timber in these areas a site index of 65 is felt to be applicable to the entire working circle for the initial plan period.

D. Selection of Rotation Period

In selecting a rotation age, the needs of the local market must be balanced against the indicated probable end product into which the major portion of the timber will be manufactured. Efforts will be made to reserve stands of quality timber for sales likely to result in manufacture of end products of commensurate value. Until revised by studies described elsewhere in this plan, it is estimated that approximately one-third of the annual harvest will eventually be manufactured into locally used products, principally lumber and timber produced from sawlogs. The generally knotty nature and poor form of the timber indicates that the rest of the volume will be manufactured into products formed from chips and fiber. The selected rotation must then be long enough so that a sufficient volume of sawlogs can be produced, and short enough to maximize fiber production for the remaining volume. Interpolating from Table 10, USDA Technical Bulletin Number 412, sawlogs of 9" D.B.H. are produced in 120 years at site index of 65. It can be further assumed that sawlogs will be produced on the better-than-average sites so that attained diameter at rotation will be somewhat larger.

For site index 65, culmination of mean annual cubic foot increment of the entire stand occurs at about 70 years. 1/ This then represents the cordwood rotation.

During the first cutting cycle on this working circle, it is assumed that approximately two-thirds of the volume harvested will be in nonquality logs and one-third in sawlogs. Therefore, a basic rotation for this plan period of 110 years has been selected, which includes an average eight-year regeneration period. This will apply to regulation of Working Group I.

Until a more specific analysis of Working Group II is made it is assumed that regeneration cutting of about one-fourth of the volume will be compatible with other uses. This would indicate a rotation approximately four times as long as the standard rotation, however, it is expected that improved operability will permit more extensive use of patch and selection cutting during the rotation. Therefore, the maximum modified rotation period of twice the standard rotation is used. (FSM 2415.23) The rotation age for Working Group II is 210 years including a six-year regeneration period.

E. Determination of Expected Yields

Normal yield tables such as those in Bulletin 412 assume a fully stocked stand, a condition rarely encountered under actual forest conditions. Generally, normal yield tables must be discounted to reflect a less-than-normal actual stocking. Because stands on the Chugach appear to closely approximate normal stands in growth and yield, volume data from either U.S.D.A. Technical Bulletins 412 or 544, may be used for inventory net yield prediction.

F. Indicated Allowable Annual Cut (MBF)

Block and Working Group	Currently Operable	
	Area	Volume (MBF) 2/
Afognak		
I	1,520	37,300
II	20	300
Anchorage		
I	200	3,900
II	40	400

1/ Table 14, USDA Tech. Bull. 412, This table is based on utilization to a 6-inch top diameter.
2/ Volume in terms of utilized scaled Scribner net.

F. Indicated Allowable Annual Cut (MBF) (Continued)

Block and Working Group	Currently Operable Area	Volume (MBF) 2/
Cordova		
I	870	20,900
II	20	200
Kenai		
I	210	3,300
II	110	1,200
Total Working Group I	2,800	65,400
Total Working Group II	190	2,100
Total Working Circle	2,990	67,500

G. Additional Cut Objective

This unregulated annual cut is calculated on presently inoperable Working Groups I and II C.F.L. It is not anticipated that any cutting during the plan period will be possible from this area. However, should a drastic and unexpected improvement in operability occur, the magnitude of possible revision in allowable cut is indicated by this figure.

Additional Cut Objective

	Scribner Inventory Net	Scaled Utilized	Cords
Chugach Working Circle	74,300	55,700 MBF	170 M

H. Sustained Yield Capacity

The separate calculations are made for Working Groups I and II based on a site index of 65. A 110-year rotation is used for Working Group I and 210 for Working Group II. The average Working Group I acre at rotation can be expected to yield 25,794 BF inventory net volume and Working Group II acre to yield 51,442 BF.

Then sustained yield capacity is calculated from the formula:

$$S.Y.C. = \frac{\text{acres} \times \text{expected inventory net yield}}{\text{rotation period}}$$

Sustained Yield Capacity - MBF

	Currently Operable	Currently Inoperable	
Afognak Block			
Working Group I	37,300	11,400	
Working Group II	600	200	
Anchorage Block			
Working Group I	4,300	15,500	
Working Group II	900	3,000	
Cordova Block			
Working Group I	22,500	46,200	
Working Group II	400	800	
Kenai Block			
Working Group I	4,400	11,500	
Working Group II	2,400	6,100	
Totals	72,800	94,700	167,500

I. Conversion Factors

Conversion factors applicable to the Chugach Working Circle are as follows:

Bd ft. Scribner to Bd. ft. Int. 1/4"	1.1079
Cu. ft. to Bd. ft. Scribner (sawtimber portion)	4.8664
Cu. ft. to cords	0.0111
Inventory Net Scribner to Utilized Scaled Scribner	.7585 1/

1/ Estimated conversion factor. When substantial annual harvest level is attained, a utilization study should be made to further refine this factor.

V. ACTION PLAN

A. Sales Policy

1. Market. Existing markets on the working circle presently require volumes equal only to about 9 percent of the allowable cut. An actual cut equal to the allowable cut could be achieved on the working circle during this plan period. However, until new log markets are established, timber sale planning emphasis will be placed on the distribution of timber to present operators, providing existing mills with sufficient timber annually to meet their demand. Sales will be made in locations which best suit economic, silvicultural and operability requirements; however, a concerted effort will be directed to harvesting decadent and overmature stands first.

Small portable mills and accompanying logging operations have proved incompatible with multiple use and timber management objectives in the past. Such operations will not be encouraged, but may be permitted if there is a reasonable demand for the product and if economics will not permit long log hauls.

It shall be a management objective to use the timber from the working circle in a manner that will provide full utilization in Alaska of the timber cut from each sale area in addition to a high level of community stability. Sales which include more timber or different types of timber than can be processed reasonably by existing local industries in accordance with Regulation S-3 (c) may require that the purchaser install, at points within Alaska, manufacturing facilities needed to obtain the above objectives. (Regulation S-3 **(b))**

2. Size of Sales. Sale action planning will be of the intensity necessary to permit preparation, advertisement, and award prior to actual needs, with emphasis on providing sales of a size sufficient to provide regularly operating loggers with a two-year supply of timber on an average basis. Size of harvest blocks is dependent on topographic conditions and volume availability. Maximum size of cutting units is not rigidly prescribed although 300 acres may be considered to be about the largest practical unit. Justification statements for units over 320 acres require Regional Forester's approval.

The demand for logs on the Kenai and Anchorage Blocks has been sporadic. Merchantable timber occurs in relatively small patches. Individual timber sales in these Blocks will probably not exceed a million board feet until progress is made on construction of Forest Development Roads. The general policy will be to increase the average size of sales, use released unit multi-payment procedures where necessary on tree measurement sales, and provide the range of sale sizes needed to meet demand.

Extensive but isolated blocks of timber exist on Afognak Island, in the Martin River-Kushtaka Lake vicinity, and, to a lesser extent, in the Patton Bay area on Montague Island. These areas will require substantial road system developments and costly camp establishments. Sales in these areas will be made when a favorable market exists and longer-term sales can be made which will provide economic stability commensurate with the capital investment and risk involved in developing these areas.

3. Sales Distribution. The end product to which new log processing plants may be directed in the future is not presently known. It is possible that manufacturing plants constructed primarily for the production of chips destined for mills in southeast Alaska may materialize. Eventually such plants could require a substantial percentage of the allowable annual cut. Since there is only a limited acreage of stands of higher quality logs and because the intrinsic value of these logs is higher for nonfiber end products, selection of sale areas should be made in light of anticipated end product uses, so that the highest intrinsic value of the stands will be recovered in the long run. For example, it may be feasible and desirable to exclude high value stands from some large sales of primarily pulp timber.

4. Contract and Utilization Standards. Timber sales will be made under the lump sum tree measurement contract where volumes cannot be scaled conveniently and economically.

Current merchantability and utilization standards for the working circle are defined in FSM R-10-2458.92, and in individual timber sale contracts.

5. Logging Methods. Logging operations and methods will be permitted as may be applicable to the terrain and to allow economic harvesting of the timber, with the least practicable damage to watershed, residual stands and other land values.

Special attention will be given to avoid erosion damage from logging and road building. Areas on which serious damage is likely to occur in spite of practical preventative measures will be deferred from cutting, pending an adequate solution.

Soil survey data will be utilized as developed to provide sale layout guides for minimizing erosion on cutovers.

Special methods and scheduling of logging may be required to prevent or control insect damage.

6. Operability. A study of operability should be undertaken early in the plan period. Operability criteria will change with evolution of logging equipment and timber values. Percentages of currently operable and inoperable commercial forest land are expected to change markedly prior to the second plan period. Where guidelines can be established which indicate volumes per acre required to make sales economically operable, and where operability criteria are re-evaluated, information will be appended to this plan for evaluation at the time the plan is revised.

7. Multiple Use Coordination. Specification of logging and road construction practices is a function of individual timber sale plans. Multiple Use Coordination practices are emphasized for timber and:

Resources

a. Recreation - FSM 2405.12
b. Watershed - FSM 2405.13
c. Wildlife - FSM 2405.14

Protection and Uses

a. Land Use - FSM 2405.21
b. Minerals - FSM 2405.22
c. Fire Control - FSM 2405.24

Services and Activities

a. Land Ownership Adjustments - FSM 2405.31
b. Engineering - FSM 2405.32.

B. Management Policy

1. Transportation Program. The 10-year road and trail program dated July 15, 1965, does not show a need for timber access roads during the 10-year period. The Transportation System Plan is being revised to consider system road needs principally on Afognak Island, Kushtaka Lake, and Martin River areas, and multi-purpose Forest Development Road programs on the Kenai and Anchorage Blocks.

2. Regeneration. The general procedure for accomplishing reforestation on the working circle is to rely on natural regeneration. An analysis of past stocking surveys indicates that reproduction surveys should be planned only on those areas where natural restocking is expected to be inadequate.

(a) Areas will be carefully examined prior to logging operations to determine what the regeneration objectives will be, considering the relative values of browse production, aesthetics,

recreation, and timber production potential. The objective of regeneration should be compared with the expected natural regeneration interval and succession to determine if sites are likely to require artifical means of regeneration. If so, sale area betterment plans will be prepared to reflect, as a minimum, the need for reproduction surveys, and to collect deposits under the K. V. Act for needed work.

(b) Scarification may be necessary in unusual circumstances. Effects of scarification are often of short duration if treatment is not followed by a good seed year. To obtain the maximum benefit, and to protect the investment made for scarification, treatment will usually be followed by direct seeding. Where scarification is necessary it can usually be most economically accomplished through a contract agreement with the operator of the timber sale area on which treatment is needed.

(c) Where artifical treatment is applied, results will be analyzed as a means of developing sound artifical regeneration programs which can be applied elsewhere on the working circle.

3. Timber Stand Improvement. Noncommercial stand improvement treatments are not planned for the first plan period. Commercial intermediate cuts are not expected during this plan period, because markets and the economics of logging low volumes per acre are not expected to permit commercial sale treatment.

4. Protection.

(a) Pest Control. Administrators and field personnel on the working circle will be alert to insect activity and evidence of widening endemic disease and will report information as requested by the Region's Insect and Disease personnel. Afognak Island is an area of particular importance. It is possible that spruce on Afognak, in a pioneer stage at the extreme end of its range, may be a very susceptible type. Compatible with other management objectives, patches of beetle-killed trees should be salvaged whenever possible.

Areas displaying noticeable defoliation by either the black-headed budworm or the hemlock sawfly will be appraised by Insect and Disease Control personnel upon request. Cutting practices and control alternatives will then be discussed with administrators and field personnel.

It has been observed that browse is filling in openings in the sparse residual timber on several hundred acres damaged in earlier insect infestations.

Field personnel should be alert to signs of a buildup in the population of red squirrels that could cause damage in paper birch stands.

Where necessary, rodent control programs will be initiated after consultation with the U. S. Fish and Wildlife Service, and the Alaska Department of Fish and Game.

(b) Fires. Protection of forest resources from damage and loss due to fire is an important phase of timber management. Expansion of timber harvesting and increased recreation use will result in a proportionate increase of damage and loss potential.

Fire mobilization and action plans for the Forest and Ranger Districts are on file. The prevention of fires on logging operations is a function of individual timber sale fire plans, (FSM 5113.32, R-10).

5. Salvage of Timber Losses

The only substantial loss of timber in recent years has been as a result of fire. Salvage of small quantities of white spruce from the Kenai Lake burn was made from 1959 to 1965.

Some losses due to fire, wind, and insects will occur. Forest personnel should take aggressive action to salvage losses wherever possible.

VI. CONTROL RECORD

Timber Management Records Atlases are maintained on each Ranger District. The Forest Supervisor will organize his records as soon as possible. The objective of these records is to provide a working circle historical account of all events related to the present and future timber management planning of the working circle. Records are organized as follows:

Section I - Working Circle Inventory Record

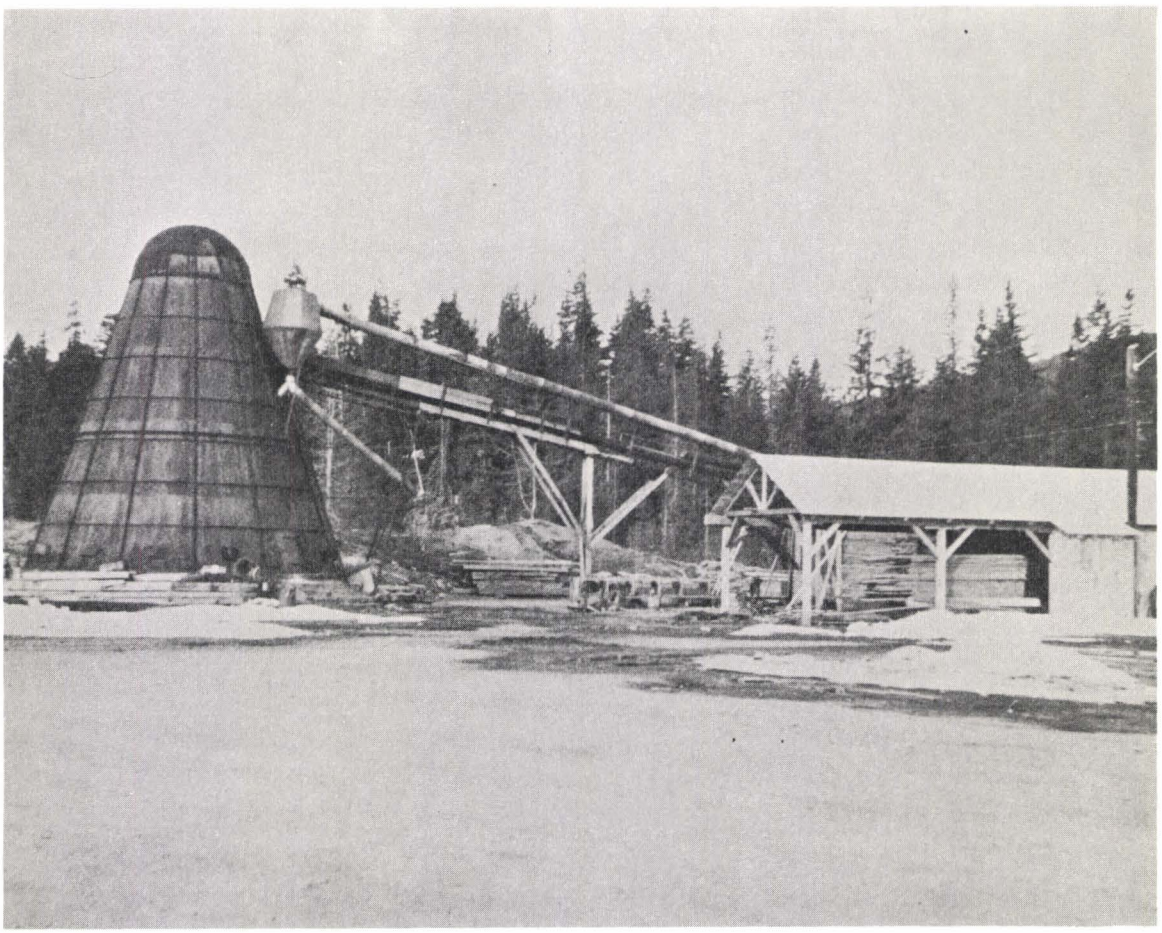
Section II - Working Circle Sale Plan Record

Section III - Working Circle Depletion Record

Section IV - Working Circle Reforestation and Timber Stand Improvement Record

Control records will be maintained in accordance with current Regional instructions, FSM 2419. Instructions for preparation of needed control reports required for national record tabulations are found in FSM 2491.1.

APPENDIX



Evans Lumber Company Mill - Anchorage, Alaska

April 1967

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

PERIODIC TIMBER MANAGEMENT PLANNING REPORT

REGION [2-3]	FOREST [4-5]	WORKING CIRCLE [6]
10	04	Chugach 3
CLASS [7]	**STATE [8-9]**	**INVENTORY YEAR [10-11]**
1	51	61

NET INVENTORY AND NET PERIODIC ANNUAL GROWTH ON NONRESERVED COMMERCIAL NATIONAL FOREST LAND

BLOCK A--CARD CODE 1

	SAWTIMBER	OTHER PRODUCTS	GROWING STOCK
1. INVENTORY: a. Local Scale *(100 MBF)*	[12-17] 14 2 5 29		
b. Int. ¼" Rule *(100 MBF)*	[18-23] 15 7 8 90		
c. Cubic Measure *(100 MCF)*	[24-29] 0 2 9 277	[30-34] 0 4 0 7 7	[35-40] 0 3 3 3 5 4
d. Stacked Measure *(100 Cds.)*		[41-45] 4 5 2 9 0	
2. NET GROWTH: a. Local Scale *(100 MBF)*	[46-50] 0 0 0 8 2		
b. Cubic Measure *(100 MCF)*	[51-55] 0 0 0 1 7	[56-59] 0 0 0 2	[60-64] 0 0 0 1 9
3. MORTALITY: Cubic Measure *(100 MCF)*	[65-69] 0 0 1 0 7	[70-73] 0 0 1 6	[74-78] 0 0 1 2 3

AREA AND INVENTORY ON PRODUCTIVE RESERVED AND COMMERCIAL NATIONAL FOREST LAND

BLOCK B--CARD CODE 2

	PRODUCTIVE RESERVED	UNREGULATED	MODIFIED LANDSCAPE	NON-MODIFIED
1. AREA *(100 Acres)*	[12-16]	[17-21] 0 3 9 6 9	[22-26] 0 0 1 6 3	[27-32] 0 0 2 9 0 9
2. SAWTIMBER *(100 MBF)*	[33-37]	[38-42] 6 7 1 6 2	[43-47] 0 2 7 4 9	[48-53] 0 7 2 6 1 8
3. GROWING STOCK *(100 MCF)*	[54-58]	[59-63] 1 6 3 3 3	[64-68] 0 0 6 9 3	[69-74] 0 1 6 3 2 8
4. OPTIONAL SPACE	SPECIFY	[75-77]	SPECIFY	[78-80]

REGULATED ALLOWABLE ANNUAL CUT AND UNREGULATED MATERIAL AVAILABLE ANNUALLY

BLOCK C--CARD CODE 3

	AREA *(100 Acres)*	SAWTIMBER *(100 MBF)*	OTHER PROD. *(100 CDS)*
1. INTERMEDIATE	[12-15]	[16-19]	[20-23]
2. SALVAGE	[24-26]	[27-29]	[30-32]
3. REGENERATION			
a. Group, Patch, Strip, Stand	[33-35] 0 3 0	[36-39] 0 6 7 4	[40-43]
b. Shelterwood, Seedtree			
(1) Preparatory, Seed	[44-46]	[47-49]	[50-52]
(2) Removal	[53-55]	[56-58]	[59-61]
c, Selection	[62-64]	[65-67]	[68-70]
4. UNREGULATED		[71-74] 0 5 5 6	[75-78]

	DATE	SIGNATURE	TITLE
PREPARED	June 30, 1967	Robert B. Mattson	FORESTER
AUDITED	July 14, 1967	Robert B. Fish	FORESTER

2400-26 (6/64)

GPO 882-006

CA-1

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

PERIODIC TIMBER MANAGEMENT PLANNING REPORT

REGION [2-3]	FOREST [4-5]	WORKING CIRCLE [6]
10	04	Chugach 3
CLASS [7]	**STATE [8-9]**	**INVENTORY YEAR [10-11]**
2	51	61

NET INVENTORY AND NET PERIODIC ANNUAL GROWTH ON NONRESERVED COMMERCIAL NATIONAL FOREST LAND

BLOCK A--CARD CODE 1

	SAWTIMBER	OTHER PRODUCTS	GROWING STOCK
1. INVENTORY: a. Local Scale *(100 MBF)*	[12-17] 00 0465		
b. Int. ¼" Rule *(100 MBF)*	[18-23] 000533		
c. Cubic Measure *(100 MCF)*	[24-29] 000107	[30-34] 00140	[35-40] 00247
d. Stacked Measure *(100 Cds.)*		[41-45] 01556	
2. NET GROWTH: a. Local Scale *(100 MBF)*	[46-50] 00001		
b. Cubic Measure *(100 MCF)*	[51-55]	[56-59]	[60-64]
3. MORTALITY: Cubic Measure *(100 MCF)*	[65-69]	[70-73]	[74-78]

AREA AND INVENTORY ON PRODUCTIVE RESERVED AND COMMERCIAL NATIONAL FOREST LAND

BLOCK B--CARD CODE 2

	PRODUCTIVE RESERVED	UNREGULATED	MODIFIED LANDSCAPE	NON-MODIFIED
1. AREA *(100 Acres)*	[12-16]	[17-21] 00424	[22-26] 00008	[27-32] 000011
2. SAWTIMBER *(100 MBF)*	[33-37]	[38-42] 00211	[43-47] 00112	[48-53] 000142
3. GROWING STOCK *(100 MCF)*	[54-58]	[59-63] 00154	[64-68] 00037	[69-74] 000056
4. OPTIONAL SPACE	SPECIFY	[75-77]	SPECIFY	[78-80]

REGULATED ALLOWABLE ANNUAL CUT AND UNREGULATED MATERIAL AVAILABLE ANNUALLY

BLOCK C--CARD CODE 3

	AREA *(100 Acres)*	SAWTIMBER *(100 MBF)*	OTHER PROD. *(100 CDS)*
1. INTERMEDIATE	[12-15]	[16-19]	[20-23]
2. SALVAGE	[24-26]	[27-29]	[30-32]
3. REGENERATION			
a. Group, Patch, Strip, Stand	[33-35]	[36-39] 0001	[40-43]
b. Shelterwood, Seedtree			
(1) Preparatory, Seed	[44-46]	[47-49]	[50-52]
(2) Removal	[53-55]	[56-58]	[59-61]
c, Selection	[62-64]	[65-67]	[68-70]
4. UNREGULATED		[71-74] 0001	[75-78]

	DATE	SIGNATURE	TITLE
PREPARED	June 30, 1967	Robert B. Mallison	FORESTER
AUDITED	July 14, 1967	Robert B. Fish	FORESTER

FOREST Chugach

DISTRICT Kenai

FIVE YEAR TIMBER SALE ACTION PLAN
F.Y. 1967 to F.Y. 1971

PLANNED SELL AND CUT IN MMBF

NAME OF SALE OR UNIT	MAP NO.	SALE OR RELEASE DATE	ACRES	UNCUT VOL. 1/1/66	LAST 1/2 FY66 SELL	LAST 1/2 FY66 CUT	FY 1967 SELL	FY 1967 CUT	FY 1968 SELL	FY 1968 CUT	FY 1969 SELL	FY 1969 CUT	FY 1970 SELL	FY 1970 CUT	FY 1971 SELL	FY 1971 CUT
Bear Lake Ridge #1	1	4/16/64	28	.05		.05										
Bear Lake Ridge #2	2	2/12/65	7	.05		.05										
Glacier Creek #2	3	3/22/65	22	.15		.15										
Little Bear Lake #2	4	10/1/65	20	.08		.08										
Snow River #1,2,3	5		60	2.00	.8			.4		.4	.8	.3		.3	.4	.6
Little Bear Lake #3,4	6		80	1.20	.2	.20	.5	.5	.5	.5						
Trail Lake #1,2	7		100	1.00							.6	.3		.3		.4
Grant Lake #1,2	8		60	.60			.3	.2	.3	.2		.2				
Bear Lake Ridge #3,4	9		70	1.20									.6	.2	.6	.6
Glacier Creek #3,4	10		70	1.00			.6	.3		.3			.4	.2		.2
Salmon Creek #1,2	11		80	1.00					.6			.6	.4	.4		
Misc. Small Sales			50	.50			.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
TOTAL SELL					1.0		1.5		1.5		1.5		1.5		1.5	
TOTAL CUT						.53		1.5		1.5		1.5		1.5		1.5

FOREST Chugach

DISTRICT Anchorage

FIVE YEAR TIMBER SALE ACTION PLAN
F.Y. 1967 to F.Y. 1971

PLANNED SELL AND CUT IN MMBF

NAME OF SALE OR UNIT	MAP NO.	SALE OR RELEASE DATE	ACRES	UN-CUT VOL. 1/1/66	LAST 1/2 F.Y. 1966 SELL	LAST 1/2 F.Y. 1966 CUT	F. Y. 1967 SELL	F. Y. 1967 CUT	F.Y. 1968 SELL	F.Y. 1968 CUT	F.Y. 1969 SELL	F.Y. 1969 CUT	F.Y. 1970 SELL	F.Y. 1970 CUT	F.Y. 1971 SELL	F.Y. 1971 CUT
Port Wells Change	12	5/14/65	60	.3		.1		.2								
Hollow Bight #2	13	7/22/65	21	.2		.2										
Loggers Cove	14	6/66	40	1.0	1.0			.6		.4						
Poe Bay	15	6/66	100	2.5	2.5			.7		.8		1.0				
Esther Bay #1	16	8/66	36	1.1			1.1	.6		.5						
Esther Bay #2	17	6/67	35	1.0			1.0			.3		.7				
N. Harrison Lagoon	18	8/67	152	3.0					3.0	.4		1.0		1.0		.6
S. E. Esther Island	19	8/68	150	2.5							2.5	.2		.9		.9
S. Granite Bay	20	7/69	160	3.2									3.2	1.0		1.0
N. Pigot Point	21	8/70	118	2.9											2.9	.4
S. Harrison Lagoon	22	7/71	60	1.5												
		Subtotal			3.5	.3	2.1	2.1	3.0	2.4	2.5	2.9	3.2	2.9	2.9	2.9
Peterson Creek	23	4/7/64	39	.2		.2										
Hope Guard Station	24	8/23/65	5	.05		.05										
Hope Garbage Dump	25	7/66	50	1.0			1.0	.5		.5						
Six Mile Creek	26	6/68	100	2.0					2.0			.5		.5		.5
Misc. Small Sales							.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
		Subtotal				.2	1.1	.6	2.1	.6	.1	.6	.1	.6	.1	.6
		Total District			3.5	.5	3.2	2.7	5.1	3.0	2.6	3.5	3.3	3.5	3.0	3.5

FOREST Chugach

DISTRICT Cordova

FIVE YEAR TIMBER SALE ACTION PLAN
F.Y. 1967 to F.Y. 1971

PLANNED SELL AND CUT IN MMBF

NAME OF SALE OR UNIT CORDOVA W.C.	MAP NO.	SALE OR RELEASE DATE	ACRES	UN-CUT VOL. 1/1/66	LAST 1/2 F.Y. 1966 SELL	LAST 1/2 F.Y. 1966 CUT	F.Y. 1967 SELL	F.Y. 1967 CUT	F.Y. 1968 SELL	F.Y. 1968 CUT	F.Y. 1969 SELL	F.Y. 1969 CUT	F.Y. 1970 SELL	F.Y. 1970 CUT	F.Y. 1971 SELL	F.Y. 1971 CUT
N.W. Montague #1	27	5/6/59	156	1.00		1.00										
N.W. Montague #2	28	2/5/65	157	4.90		.50		2.40		2.00						
Montague Lagoon	29	10/15/65	64	2.00		.30		1.00		.70						
Sheridan Glacier Flats #2	30	6/28/65	24	.28		.03		.05		.05		.05		.05		.05
Cabin Lake Road	31	12/4/64	15	.15		.15										
Sawmill Sale #1	32	12/2/65	8	.04		.04										
Piling Sale	33	9/21/64	5	.01		.01										
Cabin Lake Piling	34	4/24/64	5	.02		.02										
Mile 26	35	7/66	26	.30			.30	.30								
Sawmill Sale #2	36	7/66	20	.30			.30	.10		.10		.10				
Needles Sale	37	1/67	64	2.20			2.20	.35		1.30		.55				
Montague Straits No. 2	38	9/66	55	2.00			2.00	.50		1.50						
Two Moon #1	39	8/67	50	1.20					1.20	.50		.50		.20		
Westside Sale	40	7/68	320	9.80							9.80	3.45		4.00		2.35
Jonah Bay	41	8/68	276	4.10							4.10	2.00		2.00		.10
Two Moon #2	42	9/69	34	.85									.85	.30		.50
Snug Corner Cove #2	43	3/70	111	2.50									2.50			2.40
Sawmill Sale #3	44	4/70	23	.35									.35	.10		.10
Hanning Bay #2	45	7/70	75	2.20										2.20	1.65	
North MacLeod	46	4/71	73	2.20										2.20		
Potato Point	47	5/71	31	.53										.53		
Port Fidalgo #1	48	5/71	180	4.50										4.50		
Miscellaneous Small Sales				.10			.10	.10	.10	.10	.10	.10	.10	.10	.10	.10
TOTAL SELL							4.90		1.30		14.00		3.80	9.53		
TOTAL CUT						2.05		4.80		6.25		6.75		6.75		7.25

PRODUCTIVE RESERVED AREA

CHUGACH WORKING CIRCLE

1966

Permanent research plots established by the Northern Forest Experiment Station are reserved for uses connected with the long-term study of forest management. Each plot is less than an acre in size and is identified on the Multiple Use Atlas for the Cordova Ranger District. Plots are located in the vicinity of:

1. Nuchek, Port Etches, Hinchinbrook Island, Prince William Sound.
2. Sheridan Glacier off Copper Highway.

SUMMARY OF AREAS - WORKING GROUP I

CHUGACH WORKING CIRCLE

1966

I. Community and High Value Watersheds.

The following watersheds are important to the water supply of various communities or industries on the working circle. Logging plans for areas within these watersheds must recognize extra coordination measures as needed to assure the quality of the water resource.

A. Heney Creek, Cordova Municipal Watershed, tributary to Hartney Bay in Orca Inlet.

B. Crater Lake, North slope of Mt. Eyak, north of Cordova.

C. Meals Lake reservoir and Murcheson Creek, north on Forest boundary at Mile 3 Copper River Highway.

D. Watershed tributary to San Juan Cannery, in Sawmill Bay on Evans Island.

E. Watershed for the Nellie Juan Cannery, in McClure Bay, Port Nellie Juan.

F. Watersheds tributary to Port Ashton Cannery, Sawmill Bay, Evans Island.

G. Watersheds above the Whittier elimination, head of Passage Canal.

II. Land Under Special Use Permit to Other Agencies.

A. Lighthouse and Navigational Aid Sites

There are approximately 85 sites totaling 25,000 acres, withdrawn for purpose of lighthouses and other sea navigational aids. Most of the areas do not support merchantable timber. The only cutting restriction on these areas is that the Coast Guard should be consulted before any cutting takes place on the sites. Further identification may be obtained from District Status Atlases.

B. Whittier Townsite Withdrawal

Approximately 3400 acres have been withdrawn for the purpose of a townsite in the Whittier area by P.L.O. 219. This area is subject to the same restrictions as the Federal Aviation Agency and Coast Guard withdrawal areas. Written concurrence must be procured from the Bureau of Land Management before authorizing timber sales or land use on the area.

SUMMARY OF AREAS - WORKING GROUP II

CHUGACH WORKING CIRCLE

1966

I. Development Type Recreation Areas

A. Sheridan Flats Recreation Area (Cordova Block)
B. Portage Glacier Recreation Area (Anchorage Block)
C. Russian River Recreation Area (Kenai Block)

II. Recreation Occupancy Zones

For development beyond 1976 - recreation program period 4. Does not include buffer zones adjacent to development sites as inventoried in NFRS.

	Acres
Cordova Block	157
Kenai Block	633
Anchorage Block	406
Afognak Block	8
	1,204 1/

1/ From NFRMP - Table 15 Worksheet, period 4. Does not include buffer zones adjacent to "development sites" as inventoried in NFRS.

SUMMARY OF AREAS - WORKING GROUP III

CHUGACH WORKING CIRCLE

1966

I. Proposed Scenic Areas

A. Cordova Block

1. Columbia Glacier Scenic Area (Proposed). Contains approximately 68,000 acres. The area includes the glacier within National Forest boundaries and surrounding land mass as shown on the Cordova District Multiple Use maps.

B. Anchorage Block

1. Harriman Fiord Scenic Area (Proposed). This proposed scenic area consists of the entire drainage into Harriman Fiord that is in National Forest ownership. Harriman and Surprise Glaciers both terminate at salt water and keep the Fiord dotted with icebergs. Natural rock slides above Surprise Glacier are very common and spectacular. Dust from these slides is often mistaken for volcanic activity. This area has a superlative quality rating for a scenic area in the NFRS. Approximately 81,000 acres are included within this zone.

2. Nellie Jaun Scenic Area (Proposed). This proposed scenic area lies at the head of Port Nellie Juan between Blue Fiord and Kings Bay. Nellie Juan Glacier and the northern reaches of the Sargent Ice Field are included. Many scenic peaks and valleys are within the area. The area was rated as a superlative scenic area on the NFRS. Approximately 26,800 acres lie within this area.

3. Blackstone Bay Scenic Area (Proposed). This proposed scenic area includes the head of Blackstone Bay and the glaciers beyond. Two glaciers terminate at salt water and four others are within one-half mile. The mountains rise abruptly from tidewater and vegetation is sparse. Approximately 40,700 acres are within this zone.

C. Kenai Block

1. Crescent Lake Scenic Area (Proposed). Contains approximately 15,000 acres and includes all the watershed draining into Crescent Lake.

D. Afognak Block

1. Red Peaks Scenic Area (Proposed). This proposed scenic area lies on the northwest corner of Afognak Island. The highest peaks on the Island are within the area. These rugged peaks and the many clear lakes offer the most outstanding scenery on the Island. The area contains approximately 51,800 acres.

II. Proposed Near Natural Areas

A. Anchorage

1. Resurrection Creek Area includes approximately 138,200 acres of National Forest land. It is bordered on the west by a portion of the National Forest - Kenai National Moose Range boundary, and includes most of the Resurrection and Juneau Creek drainages; the headwaters of Devils Creek, Thurman Creek, and the Chickaloon River.

Area (A) above is currently being studied to determine it's highest form of use. Pending completion of this study, interim management will be to limit development within the area to that which would not interfere with any form of special area classification.

III. Recreation Occupancy Zones

A. Existing 1/	Acres
1. Cordova Block	40
2. Anchorage Block	292
3. Afognak Block	2
4. Kenai Block	185

1/ NFRMP Table 7 (6/30/65)

B. Proposed. 1/ Designated for development by 6/30/76 - recreation program periods 2 and 3.

	Acres
1. Cordova Block	71
2. Anchorage Block	281
3. Afognak Block	19
4. Kenai Block	458

IV. Land under Special Use Permit. 2/

	No. Permits	Acres
A. Afognak Block	14	173
B. Anchorage Block	87	1414
C. Cordova Block	196	3267
D. Kenai Block	169	2808
	466	7662

1/ From NFRMP - Table 15 Worksheet, periods 2 and 3. Does not include buffer zones adjacent to "development sites" as inventoried in NFRS.

2/ Special Use Permits, Biennial Report, 6/30/65.

HISTORICAL RECORD OF CUT

ANNUAL STATISTICS CHUGACH NATIONAL FOREST

	National Forest Commercial Timber Sales				
Calendar Year	Allowable Cut MBF	Vol. Cut MBF (Scaled)	Total Value (Stumpage)	Average Value per MBF	Payments to State from National Forest Timber Cut Receipts
CY 1909-1916		23,179	$27,067	$1.17	$6,766.75
CY 1917		6,388	7,294	1.15	1,823.50
CY 1918		5,536	7,552	1.36	1,888.00
CY 1919		5,079	8,683	1.71	2,170.75
CY 1920		4,833	8,039	1.66	2,009.75
CY 1921		2,665	4,371	1.64	1,092.75
CY 1922		3,320	4,414	1.33	1,103.50
CY 1923		4,382	7,180	1.64	1,795.00
CY 1924		3,893	6,010	1.54	1,502.50
CY 1925		3,801	6,483	1.71	1,620.75
CY 1926		4,769	7,335	1.54	1,833.75
CY 1927		3,294	5,447	1.65	1,361.75
CY 1928		6,480	10,812	1.67	2,703.00
CY 1929		5,447	9,301	1.71	2,325.25
CY 1930		6,440	9,473	1.47	2,368.25
CY 1931		5,736	9,784	1.71	2,446.00
CY 1932		3,391	5,554	1.64	1,388.50
CY 1933		3,075	4,839	1.57	Adjustment prior error - No payment
CY 1934		2,744	5,035	1.83	1,258.75
CY 1935		3,226	5,578	1.73	1,394.50
CY 1936		2,948	5,271	1.79	1,317.75
CY 1937		2,045	3,545	1.74	886.25
CY 1938		2,281	3,497	1.53	874.25
CY 1939		1,360	2,471	1.82	617.75
CY 1940		2,004	3,215	1.60	803.75
CY 1941		2,185	3,017	1.38	754.25
CY 1942		2,238	3,343	1.49	835.75
CY 1943		3,130	4,217	1.35	1,054.25
CY 1944		3,860	5,497	1.42	1,374.25
CY 1945		4,783	5,671	1.19	1,417.75
CY 1946		5,798	6,305	1.09	1,576.25
CY 1947		10,268	10,980	1.07	2,745.00
CY 1948		8,278	9,487	1.15	2,371.75
CY 1949		5,910	8,762	1.48	2,190.50
CY 1950		5,434	5,705	1.05	1,426.25
CY 1951		5,803	7,450	1.28	1,862.50
CY 1952		2,159	7,746	3.59	1,936.50
CY 1953		4,665	16,368	3.51	4,092.00
CY 1954		1,775	5,937	3.34	1,484.25

HISTORICAL RECORD OF CUT - CONTINUED

Calendar Year	Allowable Cut MBF	Vol. Cut MBF (Scaled)	Total Value (Stumpage)	Average Value per MBF	Payments to State from National Forest Timber Cut Receipts
CY 1955		4,981	$16,480	$3.31	$4,120.00
CY 1956		2,021	7,847	3.88	1,961.75
CY 1957		2,514	9,651	3.84	2,412.75
CY 1958		8,216	29,221	3.56	7,305.25
CY 1959		8,284	28,292	3.49	7,073.00
CY 1960		7,106	28,206	3.97	7,051.50
CY 1961		6,730	32,422	4.82	8,105.50
CY 1962		6,361	24,547	3.86	6,136.75
CY 1963		6,414	24,851	3.87	6,212.75
CY 1964		1,722	7,573	4.40	1,893.25
CY 1965		6,095	21,658	3.55	5,414.50
FY 1966	40,000				
FY 1967	40,000				
FY 1968	67,500				

ALLOWABLE CUT CALCULATION

A. Assumptions Pertinent to A.A.C. Calculation

1. Old growth sawtimber is over 200 years old. The stands have low vigor and have become decadent. There is no reason to expect any further net increment or loss. Yield at any age will closely approximate current inventory.

2. Young growth sawtimber is about 100 years old. Most of it is in primary stands or in stands which have followed natural catastrophic destruction of old growth. Stocking is at or above normal levels, vigor is good and yield approximating yield table values may be expected.

3. Poletimber is about 60 years old. Discussion in paragraph 2, above, applies. Any pre-commercial thinning which may be done will not significantly increase expected yields.

4. Seedling-sapling stands are about 40 years old. Discussion in paragraphs 2 and 3, above, applies.

B. Allowable Cut Calculation

Basic data pertinent to cut calculation are:

	Working Group I		Working Group II
Volume Mature Currently Operable Timber (Old and Young Growth Sawtimber) Scribner Inventory Net MBF	7,276,065		286,098
Age (present average) Years:			
Old Growth S.T.		200	
Young Growth S.T.		100	
Poletimber		60	
Seedling+Sapling Stands		40	
Rotation Years	110		210
Weighted Average R	by vol:	114	
	by area:	116	
Acreages:			
Mature (O.G.+Y.G.S.T.) Currently Operable	292,030		17,160
Poletimber Currently Operable Except for Volume	25,084		1,979
Seed-Sapling Currently Operable Except for Volume	13,816		2,500
Immature Sub Total	38,900		4,479

	Working Group I	Working Group II
Volume Mature Currently Inoperable MBF	5,677,250	331,293
Acreages:		
Mature Currently Inoperable	273,300	29,680
Poletimber Currently Inoperable	13,113	3,494
Seed-Sapling Currently Inoperable	25,191	5,080
Immature Sub Total	38,304	8,574
Normal Yield Ac. at R., Bd. Ft. (from Table 6, USDA Tech. Bull. 544)	25,794	51,442
Ave DBH of Trees 2.6" and over at R. (from Table 4, USDA Tech. Bull. 544)	9"	13"
M.A.I. /Ac. over R. (Y-R) B.F.	234	245
Total M.A.I. of Immature (Pole+S.S.) Stands Currently Operable Except for Vol. MBF	9,103	1,097
Total M.A.I. of Immature Inoperable Stands	8,963	2,101
Net Yield/Ac - Old Growth ST. (C.Oper.)B.F.	26,015	16,840
Net Yield/Ac - Young Growth ST. (C.Oper.) (based on inventory depletion only) B.F.	19,336	15,761
Net Yield/Ac - Young Growth ST. (C. Oper.) from Bull. 544 at age 190 B.F.	47,266	

$$A.A.C. = \frac{Vm}{R} + M.A.I.$$

when A.A.C. = Allowable Annual Cut
VM = Volume of Mature Timber
R = Rotation Age
M.A.I. = Mean Annual Increment

Allowable Annual Cut (Regulated):

$$A.A.C. = \frac{7,276,065}{110} + 9,103 = 75,249$$

$$A.A.C. = \frac{286,098}{210} + 1,097 = 2,459$$

Total Indicated A.A.C. MBF 77,708

AREA VOLUME CHECK

TRIAL CUT - 90,000M GOAL - CUM. CUT PERIOD - 116 YEARS

Stand/W.G.	Av. Age Now	Av. Age When Cut	Area	Net Yield/Ac Bd. Ft.	Total Yield	Years to Cut Periodic	Years to Cut Cumulative
Old Growth ST.							
W.G. I	200	237	245,720	26,015	6,392,406	71	71
W.G. II	200	237	14,490	16,840	244,012	3	74
Young Growth ST.							
W.G. I	100	187	46,310	46,702	2,162,769	24	98
W.G. II	100	187	2,670	46,702	124,694	1	99
Poletimber							
W.G. I	60	165	25,084	40,439	1,014,372	11	110
W.G. II	60	165	1,979	40,439	80,029	1	111
Seedling-Sapling							
W.G. I	40	160	13,816	40,439	558,705	6	117
W.G. II	40	160	2,500	40,439	101,098	1	118

The 118 year cut period is very close to the 116 year goal, which in turn represents an average of W.G. I and W. G. II rotations weighted by operable area of mature stands in each W.G.

The 90,000M B.F. A.A.C. is inventory Scribner net volume and is 115.8 percent of the Hanzlik formula indicated cut of 77,708 MBF.

C. Additional Cut Objective (Unregulated):

	Working Group I	Working Group II
A.C.O. = $\frac{5,677,250}{110}$ + 8,963 =	60,483	
A.C.O. = $\frac{331,293}{210}$ + 2,106		3,684
Total Indicated Addtl. Cut Objective MBF	64,167	

The A.A.C. of 90,000M is 115.8% of Hanzlik Formula cut of 77,708.17 M. Therefore, the additional cut objective and indicated cuts by block will be assumed to be proportional on the basis of this factor.

Additional Cut Objective:

Indicated 64,167 x 115.8% = 74,305MBF
Additional Cut Objective = 74,300MBF (Rounded)

D. Indicated Allowable Cut by Block:

Afognak:

W.G.I

$\frac{4,188,979M}{}$ + 4,781M = 42,863MBF

x 115.8% = 49,635MBF

W.G. II

$\frac{58,920}{210}$ = 73M = 354MBF

x 115.8% = 410MBF

Anchorage:

W.G. I

$\frac{352,003}{110}$ + 1,336M = 4,536MBF

x 115.8% = 5,253MBF

W.G. II

$\frac{50,465}{210}$ + 268 = 508MBF

x 115.8% = 588MBF

D. Indicated Allowable Cut by Block - (Continued)

	Working Group I	Working Group II
Cordova:		
W.G.I		
$\frac{2,468,174}{110} + 1,628 = 24,066$MBF		
x 115.8%	27,868MBF	
W.G. II		
$\frac{41,596}{210} + 29 = 227$MBF		
x 115.8% =		262MBF
Kenai:		
W.G. I		
$\frac{266,909}{110} + 1,357 = 3,783$MBF		
x 115.8% =	4,381MBF	
W.G. II		
$\frac{135,117}{210} + 726 = 1,369$MBF		
x 115.8% =		1,585MBF

CHUGACH WORKING CIRCLE INDICATED CUTS

	W. G. I			W. G. II		
	Ind. Cut (Inventory	Scaled Vol. (Inv. x .75)	Rounded	Ind. Cut (Inventory)	Scaled Vol. (Inv. x .75)	Rounded
Afognak	49,635M	37,226	37,300	410M	308	300
Anchorage	5,253	3,940	3,900	588	441	400
Cordova	27,868	20,901	20,900	262	197	200
Kenai	4,381	3,286	3,300	1,585	1,189	1,200
Totals	87,137M	65,353	65,400	2,645M	2,135	2,100

EXAMPLES OF METHOD OF DETERMINATION OF NORMAL YIELD FROM U.S.D.A. TECH. BULL. 544

1. 110 year stand S.I. 65

Average D.B.H. of trees 2.6" and over (from Table 4)	9"
For this diameter, international volume is 126.7% of Scribner (Table 43B, p. 1.59 Forestry Handbook)	
Reciprocal of above to convert intl. to Scribner	.789
Table 6 (Bull. 544) volume, intl. 1/8"	36,125 Bd. Ft./Ac
Reduced 9.5% to intl. 1/4"	32,693 Bd. Ft./Ac
Converted to Scribner (X.789)	25,794 Bd. Ft./Ac

2. 210 year stand S.I. 65

Average D.B.H. of trees 2.6" and over	13"
Intl. volume is 119.2% of Scribner reciprocal of above	.839
Intl. 1/8" volume (Table 6, Bull. 544)	67,750 Bd. Ft./Ac
Intl. 1/4" volume (Reduced 9.5%)	61,314 Bd. Ft./Ac
Scribner Yield (Intl. 1/4" x .839)	51,442 Bd. Ft./Ac